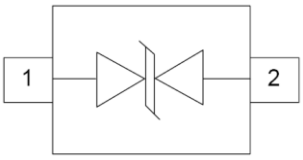
Bi-directional ESD Protection Diode

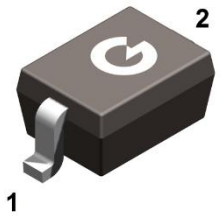
TSD03C-TSD36C

Features

HF

- 350 Watts peak pulse power (tp = 8/20μs)
- Low clamping voltage
- Working voltage: V_{RWM} = 3.3V, 5V, 8V, 12V, 15V, 18V, 24V, 36V
- Low reverse clamping voltage
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards





SOD-323

Typical Applications

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Portable instrumentation

Mechanical Data

- Case: SOD-323
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TSD03C	SOD-323	3000pcs / Tape & Reel	03C
TSD05C	SOD-323	3000pcs / Tape & Reel	05C
TSD08C	SOD-323	3000pcs / Tape & Reel	9/9
TSD12C	SOD-323	3000pcs / Tape & Reel	6/6
TSD15C	SOD-323	3000pcs / Tape & Reel	7/7
TSD18C	SOD-323	3000pcs / Tape & Reel	18C
TSD24C	SOD-323	3000pcs / Tape & Reel	8/8
TSD36C	SOD-323	3000pcs / Tape & Reel	36

Maximum Ratings (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
IEC 61000-4-2; ESD (Air)	V_{ESD-A}	±30	kV
IEC 61000-4-2; ESD (Contact)	V_{ESD-C}	±30	kV
Peak Pulse Power (t_p = 8/20μs)	P_{PP}	350	W

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	454	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	170	°C/W
Lead Solder Temperature (10 Seconds Duration)	T_L	260	°C
Junction Temperature	T_J	-55 ~ +125	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
TSD03C TVS for 3.3V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	3.3	V
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	4	-	6.5	V
Reverse Leakage Current	I_R	V_{RWM} = 3.3V	-	-	1	μA
Clamping Voltage	V_C	I_{PP} = 1A, tp = 8/20μs	-	-	7	V
		I_{PP} = 25A, tp = 8/20μs	-	-	14	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	-	250	pF
TSD05C TVS for 5V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	5	V
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	6	-	8	V
Reverse Leakage Current	I_R	V_{RWM} = 5V	-	-	1	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	-	9.8	V
		I_{PP} = 24A, tp = 8/20μs	-	-	14.5	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	-	200	pF
TSD08C TVS for 8V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	8	V
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	9	-	-	V
Reverse Leakage Current	I_R	V_{RWM} = 8V	-	-	1	μA
Clamping Voltage	V_C	I_{PP} = 1A, tp = 8/20μs	-	-	13	V
		I_{PP} = 20A, tp = 8/20μs	-	-	20	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	-	150	pF
TSD12C TVS for 12V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	12	V
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	13.3	-	16	V
Reverse Leakage Current	I_R	V_{RWM} = 12V	-	-	1	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	-	19	V
		I_{PP} = 15A, tp = 8/20μs	-	-	24	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	-	100	pF

TSD15C TVS for 15V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	15	V
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	16.7	-	20	V
Reverse Leakage Current	I_R	V_{RWM} = 15V	-	-	1	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	-	27	V
		I_{PP} = 10A, tp = 8/20μs	-	-	40	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	-	75	pF
TSD18C TVS for 18V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	18	V
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	20	-	-	V
Reverse Leakage Current	I_R	V_{RWM} = 18V	-	-	1	μA
Clamping Voltage	V_C	I_{PP} = 1A, tp = 8/20μs	-	-	28	V
		I_{PP} = 8A, tp = 8/20μs	-	-	35	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	-	70	pF
TSD24C TVS for 24V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	24	V
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	26.7	-	33	V
Reverse Leakage Current	I_R	V_{RWM} = 24V	-	-	1	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	-	46	V
		I_{PP} = 8A, tp = 8/20μs	-	-	54	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	-	50	pF
TSD36C TVS for 36V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	36	V
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	39.6	-	48	V
Reverse Leakage Current	I_R	V_{RWM} = 36V	-	-	1	μA
Clamping Voltage	V_C	I_{PP} = 1A, tp = 8/20μs	-	-	50	V
		I_{PP} = 5A, tp = 8/20μs	-	-	70	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	-	40	pF

Ratings and Characteristic Curves (@ T_A = 25°C unless otherwise specified)

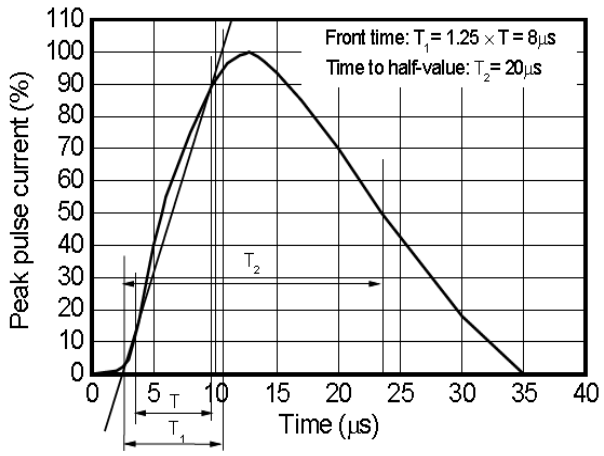


Fig 1 8/2 0μs waveform per IEC61000-4-5

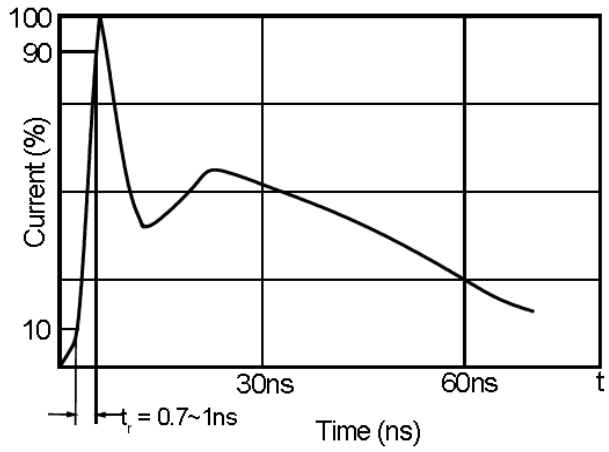


Fig 2 ESD pulse waveform according to IEC61000-4-2

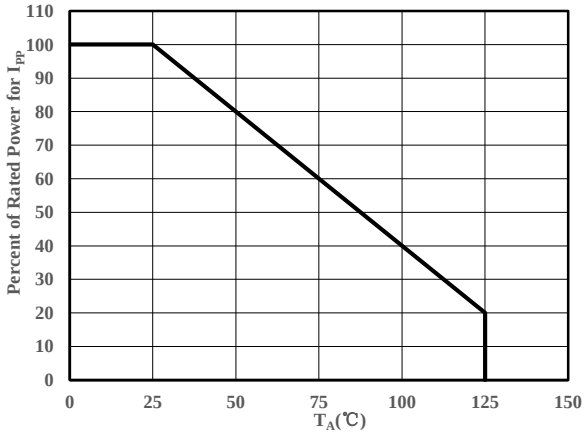
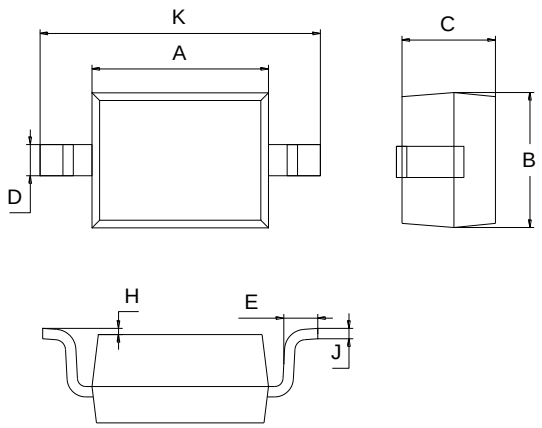


Fig 3 Power Derating Curve

Package Outline Dimensions (Unit: mm)



SOD-323		
Dimension	**Min.**	**Max.**
A	1.60	1.80
B	1.20	1.40
C	0.80	0.90
D	0.25	0.35
E	0.22	0.42
H	0.02	0.10
J	0.05	0.15
K	2.55	2.75

Package Outline Dimensions (Unit: mm)

SOD-323